

29th Australasian Association for
Engineering Education
Annual Conference
(AAEE 2018)



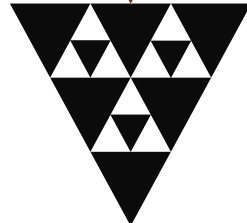
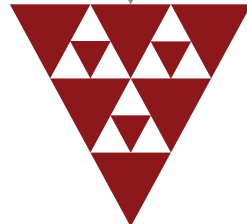
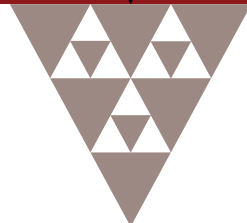
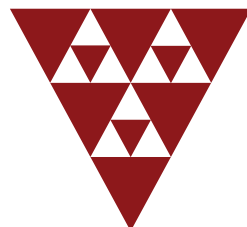
THE UNIVERSITY OF
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Te Whare Wānanga o Waikato



Wintec
WAIKATO INSTITUTE OF TECHNOLOGY
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2018



CONFERENCE HANDBOOK

9-12 December 2018

THE UNIVERSITY OF WAIKATO, HAMILTON, NEW ZEALAND

www.aaee2018.com

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ACKNOWLEDGMENTS

The Australian Association for Engineering Education and the Organising Committee thank all partnering and exhibiting companies for their support of the conference. All delegates are encouraged to spend time with the sponsors and exhibitor in the exhibition area, as without their valued support our association would be unable to provide a conference of this nature to our members.

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Speaker Partner - Professor Donna Riley



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CONFERENCE ORGANISERS

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HEALTH AND SAFETY INFORMATION

The Conference Managers, ForumPoint2 Limited, in conjunction with the AAEE 2018 Organising Committee and venues are morally and legally responsible to provide a safe and healthy environment for all attendees at the Conference. This commitment extends to ensuring the AAEE 2018 Conference operations do not place the local community at risk of any injury, illness or property damage.

All measures within our ability will be undertaken to ensure attendees are as informed as possible about any potential risks or hazards they may face whilst attending Conference.

All attendees will need to:

- Listen to the health and safety briefing onsite and/or read the health and safety document available from the registration desk
- Ensure all health and safety concerns; and all accidents or near misses are immediately reported to the registration desk.

All attendees are encouraged to be responsible for promoting a safe and healthy working environment for the entire Conference duration.

University of Waikato

First aid kit is located at the registration desk. A defibrillator is located in the Student Centre glass building directly opposite L and S Blocks.

In the event emergency medical assistance is required, please call 1-111 (Police, Fire Service or Ambulance) from emergency kiosks around the University or dial 111 from a mobile phone.

University Emergency Phone Number

Unisafe (Security) +64 7 838 4444 (from a mobile) OR 4444 from a phone inside the lecture theatres.

The nearest medical centre and pharmacy to conference is:

Hillcrest Medical Centre

8.30am – 5.00pm daily

Corner Cambridge Road and Masters Avenue, Hillcrest, Hamilton

T: +64 7 856 5087

Hamilton Anglesea Accident and Emergency Clinic

Open 24 hours

Gate 1 Corner Thackeray and Anglesea Street, Hamilton

T: +64 7 858 0800

Fire and Emergency

In the event of fire:

- On the discovery of fire, immediately activate an alarm and notify the ForumPoint2 team
- Upon hearing alarms, STOP WORK, evacuate immediately. Further instructions will be provided by the venue, please follow all directions
- Designated wardens will be on hand to guide you to the nearest emergency evacuation assembly area
- Proceed immediately to your nearest exit as instructed
- Await further instructions or clearance from the wardens for an orderly re-entry
- Fire hoses and fire alarm switches must remain visible and accessible to the public at all times



Earthquake Evacuation

- Remain inside the building
- Move away from any equipment, windows and large furniture
- Take immediate shelter under solid furniture such as tables or desks
- If an evacuation order is given, follow the fire evacuation procedures
- Keep calm and assist those around you

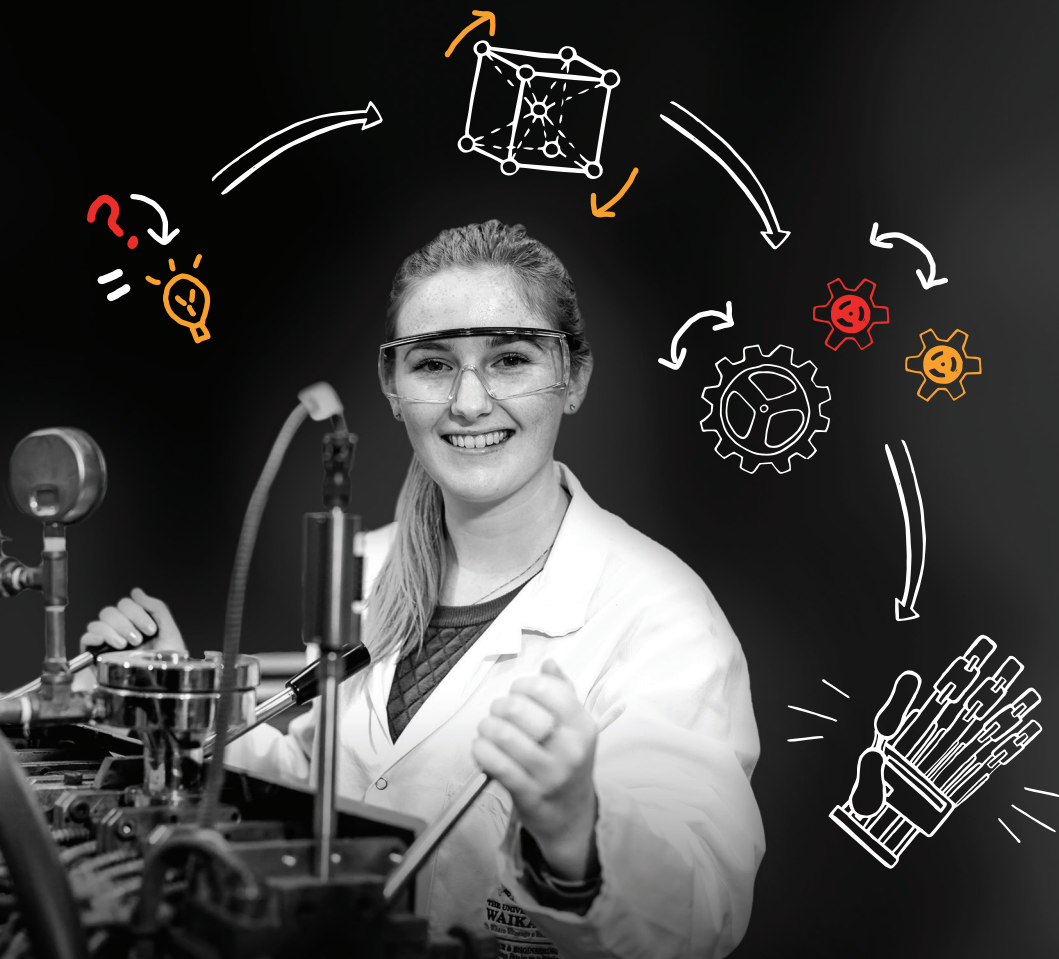
Accident Reporting

All accidents and incidents **must** be reported immediately to the registration desk or Paula Armstrong, ForumPoint2, +64 27 649 2081

Smoking

The University of Waikato Campus is a smoke-free campus





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Where the world is going



THE UNIVERSITY OF
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CONFERENCE WELCOME

Tēnā kotou katoa.

Welcome to the 29th Annual Conference of the Australasian Association for Engineering Education (AAEE). On behalf of the organising committee, Janis and I would like to welcome you to Hamilton.

This conference focusses on the increasing diversity of students coming into our classrooms, whether it is due to gender, age, ethnicity or disability. This diversity is a recognition of how our society is changing. Society needs more engineers to solve the problems that society is often creating or exacerbating. It also needs novel solutions and idea for new products and services. These challenges can be met by nurturing and supporting new ideas and creative approaches. We, as Engineering Educators, will have to work with this diversity to produce the next generation of engineering graduates.

We hope this conference will give you a platform to explore some of these ideas that will support and encourage diversity. It will be challenging and thought provoking, but we know you will take something away with you that will allow you to develop and support the new engineering graduates coming through your programmes.

Ngā mihi

Professor Janis Swan
The University of Waikato

Dr Trudy Harris
Wintec



GENERAL INFORMATION

Conference Registration Desk

The Conference registration desk is staffed by the ForumPoint2 team. If you have any questions regarding Conference or require local information, please do not hesitate to see any of the team. The registration desk will open from 4.30pm on Sunday 9 December at Wintec and from 8.00am on Monday 10 December at the University of Waikato where it will remain open for the duration of the conference.

Useful Telephone Numbers

Paula Armstrong, ForumPoint2	+64 27 649 2081
Novotel Tainui Hamilton	+64 7 838 1366
IBIS Tainui Hamilton	+64 7 859 9200
College Hall: The University of Waikato	+64 7 838 4400
Hamilton Taxi	0800 477 477 or +64 7 847 7477
Red Cabs	+64 7 839 3939

Industry Exhibition

AAEE 2018 thank all sponsoring and exhibiting companies for their support of the Conference. All delegates are encouraged to spend time with the sponsors and exhibitors in the exhibition area, as without their valued support the association would be unable to provide a conference of this nature.

Name Badges

Name badges will be given to all Conference delegates and industry representatives when they present at registration. Your name badge is your official entrance pass to Conference sessions, daily Conference catering and the Welcome Function, and is a health and safety requirement, therefore we request you wear these at all times.

We offer the opportunity to return your name badge to the registration desk at the end of Conference for recycling.

Catering During Conference

Daily catering during Conference will be served in the exhibition area level 1, S Block foyer.

Special Requirements

If you have advised us of a special dietary requirement at the time of completing your registration form, these will have been notified to the Conference caterers and an alternative option will be available for you. We ask that you please make yourself known to the catering staff. If you have any concerns, contact the team at the Conference registration desk.

Water Station

Water bottle refilling will be available in the exhibition/catering area.

Mobile Phones

During Conference sessions, we ask that mobile phones are turned off or switched to silent, and are not used when sessions are in progress.



Internet Access

Complimentary internet access is available within the Conference and exhibition area. Details will be provided at the registration desk.

Smoking

The University of Waikato is a smoke-free campus.

Parking

Parking closest to S Block at the University is via Gate 1, off Knighton Road, Hamilton.

Parking charges of \$2.00 per day (including GST) apply on campus Monday to Friday, 8.30am to 4.30pm. You cannot park in the numbered/named parks as they are reserved parks for permit holders (clamping fees apply). General parking outside of these hours is free.

How to pay for onsite parking

- Go to the nearest silver payment machine
- Enter your license plate number
- Select the tariff option that applies to you (day, week, semester)
- Select payment method; Eftpos or coin
- A receipt is available on request
- You do not need to display this on your dashboard (your license plate number in the system is proof of payment)

If you are staying at College Hall, parking will be via Gate 3B off Silverdale Road and is also \$2.00 per day excluding weekends.

Mobility Parking

Two accessibility car parks are available at the turnaround via Gate 1, Knighton Road.

Accommodation

If you have secured accommodation at College Hall, conveniently located on the grounds of the University of Waikato, please note the following:

- College Hall office is open Monday to Friday 8.30am – 4.30pm
- College Hall location is via Gate 4, Hillcrest Road, past the Marae and head for the reception area (parking at Gate 3B, off Silverdale Road)
- If checking in afterhours, please use the telephone located in the College Hall Reception to call for assistance. Contact number are provided by the phone
- Daily breakfast is served between 7.00am and 8.00am in the College Hall dining room, catering is only available for those staying at College Hall.

For all other accommodation options, standard check-in is 2.00pm onwards and check-out time is 10.00am. Please ensure all incidental accounts are settled directly with your hotel, in full, prior to your departure. AAEE 2018 and ForumPoint2 are not responsible for any unpaid accounts. Please note, hotels may levy a surcharge on credit card payments.

Evaluation

An online evaluation survey will be emailed to attendees after Conference. We welcome your feedback and would be grateful for a few minutes of your time to complete this.



Insurance

Registration fees do not include personal, travel or health insurance of any kind. Neither AAEE 2018 nor ForumPoint2 take any responsibility for delegates failing to take out adequate insurance cover.

Session Information

Instructions for Presenters of Papers

Presentations must be loaded at least one hour prior to the start of the session you are presenting in. A helper will be in the room in the break times to assist with the loading of your presentation, please ensure you check your loaded presentation. Presentations should be supplied on a USB stick in PowerPoint format. The use of the author's computer will not be allowed, in order for sessions to run smoothly.

Authors are kindly requested to meet their Session co-chairs in the session room 10 minutes prior to the start of the session they are presenting in to check-in and provide the Chairs with a short (50 word maximum) printed biography.

Additional Instructions for Session Chairs

Presentations are run from a centrally controlled presentation system in each room. Please be in the room at least 10 minutes prior to the start of your session to ensure all presentations have been checked and loaded.

The length of paper presentations are restricted to 10 minutes. Discussion will be held at the end of the session. Session Chairs are kindly asked to closely monitor timing against the scheduled programme. In case of "no show", the session must be either suspended until the time of the next paper or closed if there are no more papers in the session.

Disclaimer of Liability

Whilst we have endeavored to ensure information on the Conference website and printed material is accurate, details may be subject to change without notice. Any corrections or amendments will be notified as soon as possible. In the event of industrial disruptions, or service provider failures, AAEE 2018 and ForumPoint2 will not accept any responsibility for losses incurred by delegates.

Acceptance of oral papers does not indicate endorsement by the conference committee of any product or activity the session may promote.



CONFERENCE MOBILE APP

All the information you need to enjoy the 2018 Conference can be found within the Conference APP. The full speaker and social programme, sponsors and exhibitor listings and general information all at your fingertips.

1. Go to the App Store for iPhones, or Play Store for Androids (you will need either an Apple ID or Play Store account)
2. Search **The Event App by Events Air** and download the app
3. Enter the event code: **AAEE2018** and press submit
4. To log in, please refer to your email or visit the registration desk for your username and pin
5. The app is now ready!



If you have any difficulties see the team at the Conference registration desk



Wintec
WAIKATO INSTITUTE OF TECHNOLOGY
Te Kuratini o Waikato



SOCIAL PROGRAMME

Pōwhiri and Welcome Function

- Venue:** Wintec Rotokauri Campus
Date: Sunday 9 December
Time: 5.00pm – 7.30pm
Transport: Return coach transport departs from College Hall and the Novotel Tainui at 4.15pm and then back to College Hall and Novotel Tainui at 7.30pm.
Dress: Smart casual, we request a minimum of tidy jeans and no singlets

Join us for a traditional Māori welcome, facilitated by the Wintec kaumatua. Followed by a relaxed evening of networking over canapes and beverages. These formalities are a great way to kick off the conference and a great opportunity to catch up with old friends and meet new ones.

Conference Dinner

- Venue:** Hobbiton Movie Set, Matamata, Waikato
Date: Tuesday 11 December
Time: 4.45pm – 11.00pm
Transport: Return coach transport departs promptly from the University of Waikato at 4.45pm and back to the University/College Hall and the Novotel Tainui after dinner, at 10.00pm, 10.30pm and last coach at 11.00pm.
Dress: In theme or smart / casual - We strongly advise wearing good walking shoes for the Hobbiton tour and bringing a jacket as the evenings are cool and the venue provides a combination of marquee dining and indoor bar.

The AAEE 2018 Conference Dinner will be held at the world famous Hobbiton Movie Set at Matamata, approximately a 45 minute drive from Hamilton. On arrival at Hobbiton you will be taken on a tour of the movie set and receive a complimentary drink.

Important

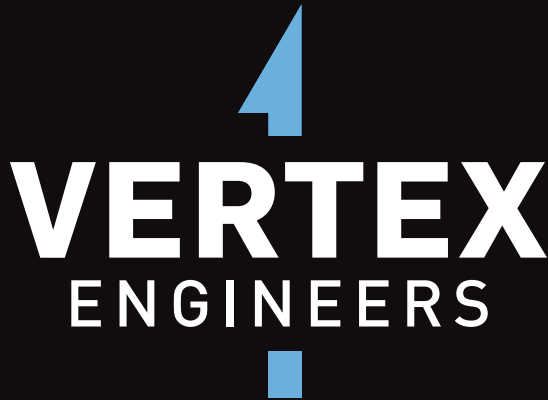
Buses will depart at 4.45pm for Hobbiton from the University only. All guests must be at the bus stop through Gate 1 on Knighton Road, 10 minutes prior to this time. Please ensure you bring a warm jacket with you on Tuesday morning – you will not have the opportunity to return to your hotel prior to departing for Hobbiton.

There will be an opportunity to visit the gift shop at Hobbiton prior to entry. Please bring your wallet for some last minute shopping.



Date	Pick up time	To arrive at venue by	From	To
Sunday 9 December				
Welcome Function Delegates depart Host Hotels for Wintec - Rotokauri Campus	4.15pm	4.40pm	Novotel Tainui Hamilton / Ibis Hamilton Victoria Street, in loading bay between Novotel and BNZ Bank	Wintec - Rotokauri Campus 51 Akoranga Rd, Hamilton
Welcome Function Delegates depart College Hall, University of Waikato for Wintec - Rotokauri Campus	4.15pm	4.40pm	College Hall, Gate 4, University of Waikato Hillcrest Road, Hamilton	Wintec - Rotokauri Campus 51 Akoranga Rd, Hamilton
Departs Wintec to Novotel	7.30pm	8.00pm	Wintec - Rotokauri Campus 51 Akoranga Rd, Hamilton	Novotel Tainui Hamilton / Ibis Hamilton Victoria Street, in loading bay between Novotel and BNZ Bank
Departs Wintec to College Hall	7.30pm	8.00pm	Wintec - Rotokauri Campus 51 Akoranga Rd, Hamilton	College Hall, Gate 4, University of Waikato Hillcrest Road, Hamilton
Tuesday 11 December				
Hobbiton Conference Dinner Delegates depart from bus stop outside shops, Gate 1, University of Waikato, Knighton Road	4.45pm	5.45pm	University of Waikato Bus stop outside shops, Gate 1, University of Waikato, Knighton Road	Hobbiton 501 Buckland Road, Hinuera
Depart Hobbiton to Host Hotels (i.e. Novotel/Ibis, College Hall)	10.00pm	11.00pm	Hobbiton Movie Set 501 Buckland Road, Hinuera	College Hall, Gate 4, University of Waikato Hillcrest Road, Hamilton then to Novotel Tainui/Ibis Hamilton , Victoria Street, in loading bay between Novotel and BNZ Bank
Depart Hobbiton to Host Hotels (i.e. Novotel/Ibis, College Hall)	10.30pm	11.30pm	Hobbiton Movie Set 501 Buckland Road, Hinuera	College Hall, Gate 4, University of Waikato Hillcrest Road, Hamilton then to Novotel Tainui/Ibis Hamilton , Victoria Street, in loading bay between Novotel and BNZ Bank
Depart Hobbiton to Host Hotels (i.e. Novotel/Ibis, College Hall)	11.00pm	Midnight	Hobbiton Movie Set 501 Buckland Road, Hinuera	College Hall, Gate 4, University of Waikato Hillcrest Road, Hamilton then to Novotel Tainui/Ibis Hamilton , Victoria Street, in loading bay between Novotel and BNZ Bank





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KEYNOTE SPEAKERS



PROFESSOR DONNA RILEY

Professor Donna Riley is Kamyar Haghighi Head and Professor in the School of Engineering Education at Purdue University. Prior to taking on this role in 2017, Dr Riley was Professor and Interim Head in the Department of Engineering Education at Virginia Tech. From 2013-2015, she served as Program Director for Engineering Education at the National Science Foundation (NSF). Riley spent thirteen years as a founding faculty member of the Picker Engineering Program at Smith College, the first engineering program at a U.S. women's college.

In 2005, she received a NSF CAREER award on implementing and assessing pedagogies of liberation in engineering classrooms.

Dr Riley is the author of two books, *Engineering and Social Justice* and *Engineering Thermodynamics and 21st Century Energy Problems*, both published by Morgan and Claypool. Riley served a two-year term as Deputy Editor of the *Journal of Engineering Education* (2012-2014), rotated through the leadership of the Liberal Education/Engineering and Society (LEES) Division of the American Society for Engineering Education (ASEE) (2007-2011), and currently serves on the ASEE Diversity Committee. She is the recipient of the 2016 Alfred N. Goldsmith Award from the IEEE Professional Communications Society, the 2012 Sterling Olmsted Award from ASEE, the 2010 Educator of the Year award from the National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP), and the 2006 Benjamin Dasher Award from *Frontiers in Education*.

Dr Riley earned a B.S.E. in chemical engineering from Princeton University and a Ph.D. from Carnegie Mellon University in Engineering and Public Policy. She is a fellow of the American Society for Engineering Education.

ABSTRACT

Accountability for Diversity: Addressing Power and Privilege in Engineering Education

As we seek to account for diversity in our practice as engineering educators, we might ask why, after decades of research and educational innovation, engineering continues to struggle to achieve diversity, equity, and inclusion by most measures. Why is change so slow, despite numerous investments from governments, industries, and non-governmental organizations? Identifying and examining root causes of inequality in engineering disciplines, we can reframe our approach to diversity in order to make greater progress. Re-imagining diversity as social justice generates numerous avenues of inquiry and critique, creates space for multiple intersecting identities and experiences, and moves us from gritty survival amid structural inequality, to envisioning new structures for a broad, resilient engineering community in which all can thrive, and from which all can benefit.





PROFESSOR RICHARD COLL

Professor Richard K. Coll is currently Deputy Vice Chancellor – Learning teaching and Student Services at the University of the South Pacific.

He holds a PhD in Chemistry from Canterbury University and a Doctor of Science Education from Curtin.

He previously worked as a chemistry and education lecturer at Waikato University in Hamilton, New Zealand, and was Vice-Chancellor at the University of Fiji before taking up his current post.

ABSTRACT

Engineering Education in the Pacific: Managing Quality and Diversity

The University of the South Pacific in its 50th year of operation has an impressive record of educational achievement, and is the premier provider of higher education in the region. The University has in recent years strived to achieve academic excellence, with a strong focus on quality, evidenced by international accreditation of its academic programs, including engineering (through IPENZ). At the institutional level, the University recently attained accreditation from the *Western Association of Schools & Colleges: Senior Colleges & Universities Commission* (WSCUC). How does the University maintain quality, when operating in an environment characterized by ethnic and cultural diversity? Meeting the needs of its diverse client base forms the basis of this presentation, along with description of work-integrated learning, and other quality and inclusiveness measures the University employs in education including engineering education.



PROFESSOR ANGUS HIKAIRO MACFARLANE

Professor Angus Hikairo Macfarlane (Ngāti Whakaue) is Professor of Māori Research at the University of Canterbury (UC), and Director of Te Rū Rangahau, the Māori Research Laboratory. His research focuses on exploring Indigenous and sociocultural imperatives that influence education and psychology. Avid about Indigenous advancement, he has pioneered several theoretical frameworks associated with culturally-responsive approaches for professionals working across the disciplines.

Professor Macfarlane's prolific publication portfolio and exemplary teaching abilities have earned him national and international standing in his field of scholarship. In 2010, he received the Tohu Pae Tawhiti Award from the New Zealand Council for Educational Research for outstanding contributions to Māori research over an extended period of time. In 2013, he was the first Māori recipient of the University of Canterbury Research Medal – the highest honour that the UC Council can extend to its academic staff.

In 2015, he received the national Ako Aotearoa Tertiary Teaching Excellence Award for specialist services in the field of kaupapa Māori. Last year the UCSA awarded him the Supervisor of the Year title for his exceptional mentoring of postgraduate scholars whose interests include exploring cultural diversity and its dynamic features from the past, the present, and into the future.

Professor Macfarlane has recently been made a Fellow of the Royal Society of New Zealand.

ABSTRACT

Totiū te mātauranga: Repositing the emphasis

This presentation introduces a framework, He Awa Whiria, within which a culturally-inclusive process and a set of guidelines are described, explained and proposed for application for evidence-based teaching that is challenging, yet manageable in the pedagogical space. One of the objectives of the presentation is to propose building an acceptance of diversity in the teaching and learning space through considering knowledge systems to shift thinking from a 'one stream' paradigm - where mainstream dominant knowledge has reigned - to a 'two stream' approach where Māori knowledge (mātauranga Māori) has a rightful place of equal status. This work should not be seen as being an approach that is exclusive of other cultures or worldviews as it also provides a platform for other cultural paradigms to be considered and included. Importantly and significantly, however, this framework acknowledges that kaupapa Māori (Indigenous philosophy) has an integrity of its own.





ASSOCIATE PROFESSOR SONJA HERAHINE MACFARLANE

Associate Professor Sonja Herahine Macfarlane (Ngāi Tahu; Ngāti Waewae) is an Associate Professor (Senior Research Fellow) at University of Canterbury (UC), and Co-Director of Te Rū Rangahau, the Māori Research Laboratory. Her research, publications and teaching collectively focus on culturally responsive evidence-based approaches in education, psychology, counselling and human development.

Sonja is passionate about social justice, equity and human rights, and contributing to Māori advancement. Her work has been widely published in leading research journals, both nationally and internationally. In 2017, Sonja received the Tohu Pae Tawhiti Award from the New Zealand Council for Educational Research (NZCER) for her outstanding contributions to Māori research over many years.

In that same year, she was the member of a team that received the Research Team Award conferred by UC's College of Education, Health and Human Development. In 2015, she was a co-recipient of the CLNZ Education Award "Best Resource in Higher Education", and in 2014 was the recipient of a UC Research Excellence Award. Sonja is a member of the New Zealand Psychological Society, as well as a research and advisory member on several ministerial-funded projects and advisory boards.

PROGRAMME

Sunday 9 December 2018

4.30pm	Registration Opens <i>Venue: Wintec, Rotokauri Campus</i>
5.00pm – 7.30pm	Pōwhiri and Welcome Function <i>Venue: G-Block Foyer, Wintec, Rotokauri Campus, Hamilton</i>
<i>All conference sessions from Monday 10 to Wednesday 12 December will take place at University of Waikato, Hamilton.</i>	

Monday 10 December 2018

8.00am	Registration Opens <i>Venue: Ground Level Foyer, S Block, University of Waikato</i>
8.30am – 10.30am	Conference Opening and Plenary Session 1 <i>Venue: L.G.01, L Block, University of Waikato</i> <i>Chair: Janis Swan and Trudy Harris</i>
8.30am – 8.50am	Welcome to Country - Mihi Whakatau
8.50am – 8.55am	Vice Chancellor (University of Waikato) Neil Quigley
8.55am – 9.00am	Acting Chief Executive (Wintec) Dave Christiansen
9.00am – 9.05am	Welcome by Conference Chair
9.10am – 10.05am	Totiū te mātauranga: Repositioning the emphasis Angus Macfarlane
10.05am – 10.15am	AAEE President Address Tom Goldfinch
10.15am – 10.25am	Engineering Futures 2035 Doug Hargreaves
10.25am – 10.30am	Group Photo
10.30am – 11.00am	Morning Tea and Exhibition <i>Venue: Upper Foyer, S Block</i>



Parallel Sessions				Workshop 1D Venue: SB.2	
11.00am – 12.30pm	Parallel Session 1A Venue: S.1.02 Chair: Sally Male	Parallel Session 1B Venue: S.1.03 Chair: Matthew Hughes	Parallel Session 1C Venue: S.1.04 Chair: Steven Goh	11.00am – 12.30pm Using practice architectures theory to support writing practices in the engineering curriculum ¹⁶¹ Rosalie Goldsmith, Keith Willey	
11.00am – 11.10am	Faculty attitudes towards integrated engineering as a concept and a curriculum ⁷⁸ Tom Goldfinch, J Vulic, K Willey, G Miao, R Fiford, A Hadigheh	Connection to country - Building a connection to Indigenous knowledges in engineering education ¹⁴⁹ Jennifer Turner, A Burt, L Mann	Enhancing innovation and entrepreneurial competences of engineering students through a systematic cross-industry innovation learning course ⁶ Pavel Livotov		
11.10am – 11.20am	Embedding a Management System for Engineering Education (MaSEE) into curricula ⁴¹ Bernadette Foley, T Gill, E Palmer, S Eglinton-Warner, B Senadi, E Martinez-Marroquin	Designing an on-country engineering education experience in collaboration with the Gunditjmarra community ¹¹¹ Juliana Kaya Prpic, Damein Bell	A new higher education curriculum model to meet the needs of the Civil Construction industry ¹⁰³ A Irvine, J Irvine, Andrew Rose		
11.20am – 11.30am	Reflections on a large curriculum change project ¹⁴⁹ Roger Hadgraft, B Francis, J Lawson, R Jarman	Cross-cultural construction engineering with aboriginal communities ¹⁵⁸ Cat Kutay, B Gunay, C Tobin	Aligning student projects and curriculum design in mechanical engineering design courses to meet the needs of local industries ⁷¹ Lim Jen Nee Jones, M Ismadi, B Thong Tan, S Wordley		
11.30am – 11.40am	ALoHA! Aligning learning outcomes and assessment. First stages of a constructive alignment and curriculum mapping project at a unit and faculty level ⁷² Veronica Halupka, T Nguyen, WM Woo, J Lamborn	How we tell our engineering stories ¹⁵¹ Cat Kutay, Elysebeth Leigh	Diversity games that highlight importance of diversity and collaboration for engineering and project management students ¹⁴⁴ Ehassan Sakhaee, R Eymont		

11.40am – 11.50am	Understanding the feasibility of micro-credentials in engineering education ¹⁰ Brenden Mischewski, <i>A Christie</i>	He Toki engineering leaders ¹⁷¹ A Te Whetu, Kym Hamilton, <i>E Tarena</i>	Developing critical thinking and intellectual design skills via collaborative projects in engineering and business postgraduate studies ⁵³ Mahyar Shirvanimoghaddam	
11.50am – 12.00pm	Using micro-credentials to improve Pasifika participation in engineering education ⁴⁰ Neel Pandey, L Falema'a	Strategies for promoting cultural diversity within student laboratory groups in an engineering degree course at an Australian University ³² <i>S Jaikaran-Doe, B Le'on de la Barra, S Lyden, I Wang, F Fan, A Henderson, E Franklin, Peter Doe</i>	Enhancing students' reflections in performance planning and review subjects ⁶⁶ Reza Mahinroosta, <i>J Devitt</i>	
12.00pm – 12.30pm	Discussion	Discussion	Discussion	
12.30pm – 1.30pm	Lunch and Exhibition <i>Venue: Upper Foyer, S Block</i>			
1.30pm – 3.00pm	Parallel Sessions			
	Parallel Session 2A <i>Venue: S.1.02</i> <i>Chair: Mohammad Al-Rawi</i>	Parallel Session 2B <i>Venue: S.1.03</i> <i>Chair: Neel Pandey</i>	Parallel Session 2C <i>Venue: S.1.04</i> <i>Chair: Anne Gardner</i>	Workshop 2D <i>Venue: SB.2</i>
1.30pm – 1.40pm	Using census data to better understand engineering occupational outcomes ³² Stuart Palmer, <i>M Campbell</i>	A framework for promoting diverse voices in the design cycle ¹⁶⁶ Ellen Lynch, C Browne	Effectiveness of first year mentoring program on increasing student sense of belonging and correlation with motivation ¹³⁷ Charles Hoke, W Smith, <i>K Wilson</i>	1.30pm – 3.00pm Design factory New Zealand: A co-creation space where students work in multidisciplinary teams with industry partners to solve complex problems ¹⁵⁷ Elna Fourie, Aidan Bigham



	Parallel Session 2A cont. <i>Venue: S.1.02</i> <i>Chair: Mohammad Al-Rawi</i>	Parallel Session 2B cont. <i>Venue: S.1.03</i> <i>Chair: Neel Pandey</i>	Parallel Session 2C cont. <i>Venue: S.1.04</i> <i>Chair: Anne Gardner</i>	Workshop 2D cont. <i>Venue: S8.2</i>
1.40pm – 1.50pm	Rethinking progression of engineering students: Influential factors ¹⁶ Xianbo Zhao, J Pienaar, F Martin	Using culturally relevant game-based education strategy ¹⁸² Anuroop Gaddam, K Lundqvist	First contact – engaging engineering students in professional skills ¹⁰⁶ C Mankelow, Jim Hefkey	
1.50pm – 2.00pm	Employer and lecturer perceptions of science and engineering graduate competencies: Implications for curricular and pedagogical practice ⁵⁹ Elaine Khoo, K Zegwaard, A Adam	Supporting diversity: The emotional experience of different minority groups ⁷ KF Wilson, Kate Wilson	A novel approach to professional empowerment of engineers ⁷⁰ P Cebon, Juliana Kaya Prpic, A Ooi	
2.00pm – 2.10pm	Reflective practice in continuous professional development ¹³ Thanh Nguyen, M Bevis, J Lamborn	A conceptual framework to analyse diversity of perceptions in engineering students of learning management concept ²² K Dini, Aaron Blicblau, A Abdekhodae	Finding the sweet spot - The key to enduring industry relationships ¹⁵⁶ Jennifer Turner, T Smith, E Crossin	
2.10pm – 2.20pm	A new professional engagement program – outline and initial outcomes ⁶⁷ Anthony Kadi, D Lowe	Capitalising on student diversity in a masters level unit of study on safety systems and risk analysis ¹¹⁶ Rodney Fiford	Write your own reference: An innovative assessment strategy for quality self-reflections in engineering education ⁵⁴ Miao Li, E Lindsay	
2.20pm – 2.30pm	Mapping competency of final year engineering projects with AQF8 goals ¹⁶⁴ Mohammad Rasul, A Sayem, U Mumtahina	Dancing at the party: Educational practices in engineering education that foster diversity and inclusion ⁶⁹ R Chang, F Maclean, J Dohane, Llew Mann	A numerical unhappiness function for allocating cadet engineers to placement positions ⁵⁸ E Lindsay, Reza Mahinroosta	
2.30pm – 3.00pm	Discussion	Discussion	Discussion	

3.00pm – 3.30pm	Afternoon Tea and Exhibition <i>Venue: Upper Foyer, S Block</i>		
	Workshop 3A <i>Venue: S.1.02</i>	Workshop 3B <i>Venue: S.1.03</i>	Workshop 3C <i>Venue: SB.02</i>
3.30pm – 5.00pm	Beyond the qualification – a guided self-assessment for future-proofing engineering education for a diverse workforce ¹⁴⁷ Natalie Lloyd, Eva Cheng, Art Agrawal	Implementing virtual work integrated learning ¹⁴⁶ Sally Male, David Pointing, Doug Hargreaves	Engineering futures 2035 ¹⁷⁸ C Crosthwaite, D Hargreaves, J Wilson, P Lee, B Foley, I Burnett, T Goldfinch, Mark Symes



Tuesday 11 December 2018

7.30am	Registration Opens <i>Venue: Downstairs Foyer, S Block, University of Waikato</i>			
8.00am – 9.30am	Parallel Sessions			
	Parallel Session 4A <i>Venue: S.1.02</i> <i>Chair: Maryam Moridnejad</i>	Parallel Session 4B <i>Venue: S.1.03</i> <i>Chair: Mark Symes</i>	Parallel Session 4C <i>Venue: S.1.04</i> <i>Chair: David Lowe</i>	Workshop 4D <i>Venue: SB.2</i>
8.00am – 8.10am	Development of student confidence for academic success ²³ Aaron Blicblau	Visually exploring sentiment and keywords for analysing student satisfaction data ⁸³ Samuel Cunningham-Nelson, <i>M Baktashmotlagh, W Boles</i>	Demystifying contemporary learner engagement: CQUniversity Engineering ¹¹² Aruna Jayasuriya, <i>F Martin, B Taylor</i>	8.00am – 9.30am Validating storytelling for indigenous knowledge teaching ⁵² Cat Kutay, Elysebeth Leigh
8.10am – 8.20am	One step ahead of national strategy: Integrating global competence in engineering education ¹⁷⁷ Björn Kjellgren, E Keller	Exploring the student experience of industry placements using sentiment analysis ⁹⁶ Melanie Fleming, <i>B Coulter, S Weaver</i>	Student engagement: how to quantify ²⁰ Nirmal Mandal	
8.20am – 8.30am	Reducing software engineers' "Fear of the large" ¹²⁷ Chris McDonald	Improving student engagement, experience and performance through experiential learning in a first year Engineering Mechanics course ⁹⁹ Shanmuganathan Gunalan, <i>B Gilbert, H Guan, H Karampour, J Crough</i>	Assessment of engineering professional skills through EPSA rubric class administrations ⁹¹ Hadisanton Hadisanton, <i>G Rowe, N Giacaman</i>	

8.30am – 8.40am	Complexity makes me feel incompetent and it's your fault ⁶³ Keith Willey, T Machel	Feedback approach and its effectiveness; finding a new way to utilize the feedback more effectively in undergraduate engineering studies ¹⁶³ A Sayem, Mohammad Rasul, U Mumtahina	Creative engineering graduates – developing diverse thought ³⁷ John Baxter-Lindsay, P Briozzo	
8.40am – 8.50am	Can one class hour improve creative problem solving self-efficacy ¹⁷³ John Smith, J Belski, N Brown, J Kalyvas	Towards deterring contract cheating: Stimulating students' motivation through authentic assessment design ¹⁶⁷ Samer Skaik, J Borg	Lessons learned: Understanding online engagement satisfaction in a large postgraduate Information Assurance Principles (IAP) course ⁶⁸ Elena Sitnikova, M Saberi, K Joiner, D Townsend, E Robertson	
8.50am – 9.00am	Human-centrics and design thinking in engineering practice ²⁸ Warren Reilly, B McBride	Discussion	Combined civil engineering and surveying field week – improved student outcomes ² Bruce Harvey	
9.00am – 9.30am	Discussion		Discussion	
9.30am – 10.00am	Morning Tea and Exhibition <i>Venue: Upper Foyer, S Block</i>			



10.00am – 11.30am	Plenary Session 2 Venue: L.G.01, L Block Chair: Tom Goldfinch			
10.00am – 10.45am	Accountability for Diversity: Addressing Power and Privilege in Engineering Education Donna Riley - Fullbright Scholar			
10.45am – 11.30am	Panel Discussion: Donna Riley Sonja Macfarlane Richard Coll Sheryl Sorby			
11.30am – 12.30pm	Lunch and Exhibition Venue: Upper Foyer, S Block			AAEE Annual General Meeting Venue: S.1.02
12.30pm – 2.00pm	Parallel Sessions			
	Parallel Session 5A Venue: S.1.02 Chair: Gerard Rowe	Parallel Session 5B Venue: S.1.03 Chair: Chris Whittington	Parallel Session 5C Venue: S.1.04 Chair: Colin Kestell	
12.30pm – 12.40pm	ATAR, prior knowledge and performance in idea generation ⁸¹ Gavin Buskes, I Belski	Evaluating the impact of the YoWIE summer school on girls' perception of engineering ³⁷ Toby Boyson	A heutagogical approach for teaching a numerical analysis subject in engineering ¹²⁸ Peter To, R Tuladhar	
12.40pm – 12.50pm	If I don't have a language to discuss and think about it then it's not part of my reality ⁶¹ Keith Willey, A Gardner	Spatial skills and problem solving: Comparing low and high visualisers across genders in chemical engineering ⁸⁴ Grace Panther, S Sorby	Regular and automatic feedback of concepts as formative assessment ⁸⁷ Samuel Cunningham-Nelson, M Mukherjee, A Goncher, W Boles	
12.50pm – 1.00pm	Facilitating effective teamwork - engineering instructors' perspectives on strategies ³⁰ Jiachun Huang, T Vo, S Wordley, K Ryan	Strategies to increase equity and access in engineering internships ¹⁰⁷ Natalie Lloyd, S Male, M Paull	Creativity in mechanical design: The use of visually diverse ethnography methodologies for better practice ⁸⁹ Paul Briozzo, R Fiford	

1.00pm – 1.10pm	Individual student assessment in team projects: A team charter approach ¹⁹ Nirmal Mandal	Capstone mechanical engineering design project – develop an interactive ball run display as STEM activity for the Waikato Museum ⁴⁹ Shen Hin Lim, P Higgins, R Jangali, G Neshausen	Safe system learning for tertiary road transport engineering students ¹²⁹ Christopher Stokes, W Moan, J Strandroth, J Woolley, N Johansson
1.10pm – 1.20pm	Encouraging engineering students participation in face-to-face peer learning ¹ R Shwartsman, Liyuan Fan, V Trieu	Is engineering for me? Do girls have enough information to decide? ³² Janis Swan, B Cowie	Factors that influence peer learning in social media enhanced engineering courses ¹²⁰ Mohsen Dokhanchi, L Kavanagh, C Reidsema
1.20pm – 1.30pm	Implementation of marker training exercises to improve marking reliability and consistency ¹⁰⁸ Gavin Buskes, H Chan	Where do New Zealand female engineers come from? Insights from a quantitative analysis ⁴⁸ Paul Docherty	Spatial skills and their correlation with engineering problem-solving ¹⁸³ Sheryl Sorby, G Duffy, N Loney, L Perez
1.30pm – 2.00pm	Discussion	Discussion	Discussion
2.00pm – 2.30pm	Afternoon Tea and Exhibition Venue: Upper Foyer, S Block		
	Workshop 6A Venue: S.I.02	Workshop 6B Venue: S.I.03	Workshop 6C Venue: SB.02
2.30pm – 4.00pm	Cultural diversity in engineering laboratory and project group work ³³ S Jaikaran-Doe, B Leon de la Barra, I Wang, A Henderson, E Franklin, Peter Doe	Facilitating interdisciplinary teamwork with boundary negotiating artifacts ⁴⁴ Kacey Beddoes, Grace Panther	Developing 3-D spatial skills for engineering success ¹⁶⁵ Sheryl Sorby
4.45pm	Transport departs for Hobbiton Movie Set from The University of Waikato		
6.00pm till late	Conference Dinner Venue: Hobbiton Movie Set, 501 Buckland Road, Hinuera, Matamata		



Wednesday 12 December 2018

8.00am	Registration Opens <i>Venue: Downstairs Foyer, S Block, University of Waikato</i>				
9.00am – 9.45am	Plenary Session 3 <i>Venue: L.G.01, L Block</i> <i>Chair: Janis Swan</i>				
9.00am – 9.45am	Engineering Education in the Pacific: Managing Quality and Diversity Richard Coll				
9.45am – 10.15am	Morning Tea and Exhibition <i>Venue: Upper Foyer, S Block</i>				
10.15am – 11.45pm	Parallel Sessions				
	Parallel Session 7A <i>Venue: S.1.02</i> <i>Chair: Roger Hadgraft</i>	Parallel Session 7B <i>Venue: S.1.03</i> <i>Chair: Aidan Bigham</i>	Parallel Session 7C <i>Venue: S.1.04</i> <i>Chair: Keith Willey</i>	Workshop 7D <i>Venue: SB.2</i>	
10.15am – 10.25am	Identifying students' procedural and conceptual difficulties with mathematics ²¹ Nigel Shepstone	Experiencing disability: A preliminary analysis of professional identity development in U.S. undergraduate civil engineering students ⁸ Cassandra Groen-McCalli , L McNair, M Paretti, A Shew, D Simmons	How to maintain the conversation, group work and peer assessment when a modest post-graduate course goes big ¹⁸⁴ Navid Haghdadi , I MacGill	11.00am – 12.30pm Technology-enabled international joint courses ¹⁶⁰ Ang Liu, Yun Dai, S Lu, A Trowbridge	
10.25am – 10.35am	Strategies for teaching engineering mathematics ²⁶ Maree Lake , N Lake, R Vasquez Padilla	Recognising diversity in the improvement of educational practice ⁵³ H Marzbani, M Jollands, Colin Kestell	Implementation of team-teaching in a large class through a flipped learning approach for an engineering design unit ⁸⁶ Mohd-Zulhimi Paiz Ismadi , L Jones, S Wordley		

10.35am – 10.45am	Teaching Physics concepts without (much) mathematics: View through a concept-index, threshold-concept lens ⁹ <i>M Wilson, L Streeter, S Seshadri, Jonathan Scott</i>	Reflecting on our own learning: Incorporating diverse worldviews into teaching and learning activities ¹⁵⁹ Mohammad Al-Rawi, <i>J Khanna, A Lazonby</i>	Team-based assessment in a large class ¹⁵ Kana Kanapathipillai, <i>L Collins</i>
10.45am – 10.55am	Mathematics in a practice-based course: Entry requirements and diversity ¹²⁵ Emily Cook	Understanding student absenteeism in undergraduate engineering programmes ¹¹⁰ <i>S Bakrania, Chris Whittington, T Anderson, R Nates</i>	Delivering and engineering course across multiple campuses and online ¹⁵⁴ Fae Martin, A Jayasuriya, <i>B Taylor</i>
10.55am – 11.05am	A new learning environment through improved learning objectives in an introductory solid mechanics course ³⁹ Christopher McGann	A human centred design ‘makerthon’: The creation of a framework for teaching humanitarian engineering competencies ²⁹ Wenqian Gan, R Fiford, <i>N Brown, S Perkins, C Wong</i>	Teaching safety in design in large classes using VR ¹⁰¹ Sally Male, P Kenworthy, <i>G Hassan, A Guzzomi, T Van Der Veen, J French</i>
11.05am – 11.15am	Discussion	Developing awareness of stakeholders: Contrasting professional ethics education in engineering and medicine ³⁵ Iain Skinner, A Torda	Redesign of first year ‘Principles of Engineering Design’ course ¹¹³ Febelyn Reguayal, C Toma
11.15am – 11.45am		Discussion	Discussion



11.45am – 12.45pm	Lunch and Exhibition <i>Venue: Upper Foyer, S Block</i>			
12.45pm – 2.25pm	Parallel Sessions			
	Parallel Session 8A <i>Venue: S.1.02</i> <i>Chair: Robert Dantzer</i>	Parallel Session 8B <i>Venue: S.1.03</i> <i>Chair: Prue Howard</i>	Parallel Session 8C <i>Venue: S.1.04</i> <i>Chair: Graham Town</i>	Workshop 8D <i>Venue: SB.2</i>
12.45pm – 12.55pm	Application of BYOD-based pedagogy in engineering education ⁵⁶ Hossein Askarinejad, <i>L Alton</i>	A pilot initiative on improving students' task value perceptions of high school mathematics through practical STEM interventions ¹⁰⁰ B Taylor, Claire-Marie McLean, <i>A Duncan, A Jayasuriya, R Dodd, T Whiting</i>	Student perceptions of open-book and closed-book exams in postgraduate engineering management subjects ¹¹⁹ <i>H Al-Kildar, A Sixsmith, R Leveaux, G Mooney,</i> Natalie Lloyd	1.30pm – 3.00pm He Awa Whiria: Weaving indigenous and western perspectives and creating inclusion in Australasian engineering education ⁹⁴ Matthew Hughes, Juliana Kaya Prpic, Tom Goldfinch, Jade Kennedy
12.55pm – 1.05pm	Investigation of learning resource requirement to improve student engagement and satisfaction ⁹² Shaminda de Silva, <i>T James, A Jayasuriya, T Simpson</i>	What's your purpose? Redefining the being and becoming of future engineers through professional purpose ⁹⁵ Jacqueline Dohaney, <i>L Mann, A Coddington</i>	Changing student dispositions to learning: Preliminary findings of a case study ⁷⁹ Nigel Robertson	
1.05pm – 1.15pm	Streamlining student course requests using chatbots ⁹⁰ Melanie Fleming, <i>P Riveros, C Reidsema, N Achilles</i>	Attracting future engineers through practical and collaborative initiatives ¹⁷⁵ Levinia Paku, <i>M Jensen, R Evans</i>	Conceptualisations of academic rigour in engineering degree programs ³⁶ David Lowe, <i>K Willey</i>	

1.15pm – 1.25pm	A computer-assisted, personalized approach for efficient evaluation of large-scale assessment applications ⁸² L Senevirathna, A Goncher, James Morgan	Future proofing engineers through embedded systems design ⁷⁵ D Preethichandra, U Izhar	Fostering project management competencies in undergraduate engineering: An exploration of the use of management-educated tutors as coaches in problem-based learning ⁵⁷ Elaine Khoo, Jonathan Scott, D McKie, Bronwen Cowie
1.25pm – 1.35pm	Diverse students and lecture recording technology: Can lecture recording replace lectures? ¹⁸⁰ Maimuna Musarrat, N Huda, B Williams, B Loch	Pedagogy, practice, participation: Reimagining edtech onboarding ¹²⁴ Sharanya Yoganathan, N Sherburn, V Halupka, J Li	The future of intelligent education is not artificial ¹⁸ Rudolf Zettler
1.35pm – 1.45pm	Thinking outside of the box ⁷⁶ Guien Miao, S Clarke, R Mammucari, L Parker	Articulation of Chinese students into an Australian engineering degree ¹⁷⁶ S Jaikaran-Doe, Sarah Lyden, Peter Doe	Core Concepts and Challenges in Sustainable Engineering Education in Australia ¹⁷⁹ Michele Rosano, J Scott, B Cowie
1.45pm – 1.55pm	An investigation on learning fundamental structural concepts and practical evaluation of e-learning through the platform Xorro-Q ¹⁶⁸ James Lim	Can we select students who will go on to be successful engineers? ¹⁰⁵ Enda Crossin, J Dohaney	Students as partners: developing a dialogue for change ⁴² Melanie Fleming, L Kavanagh, C Reidsema, A Waris, M Lee, S Liu, R Kara-Manning
1.55pm – 2.25pm	Discussion	Discussion	Discussion

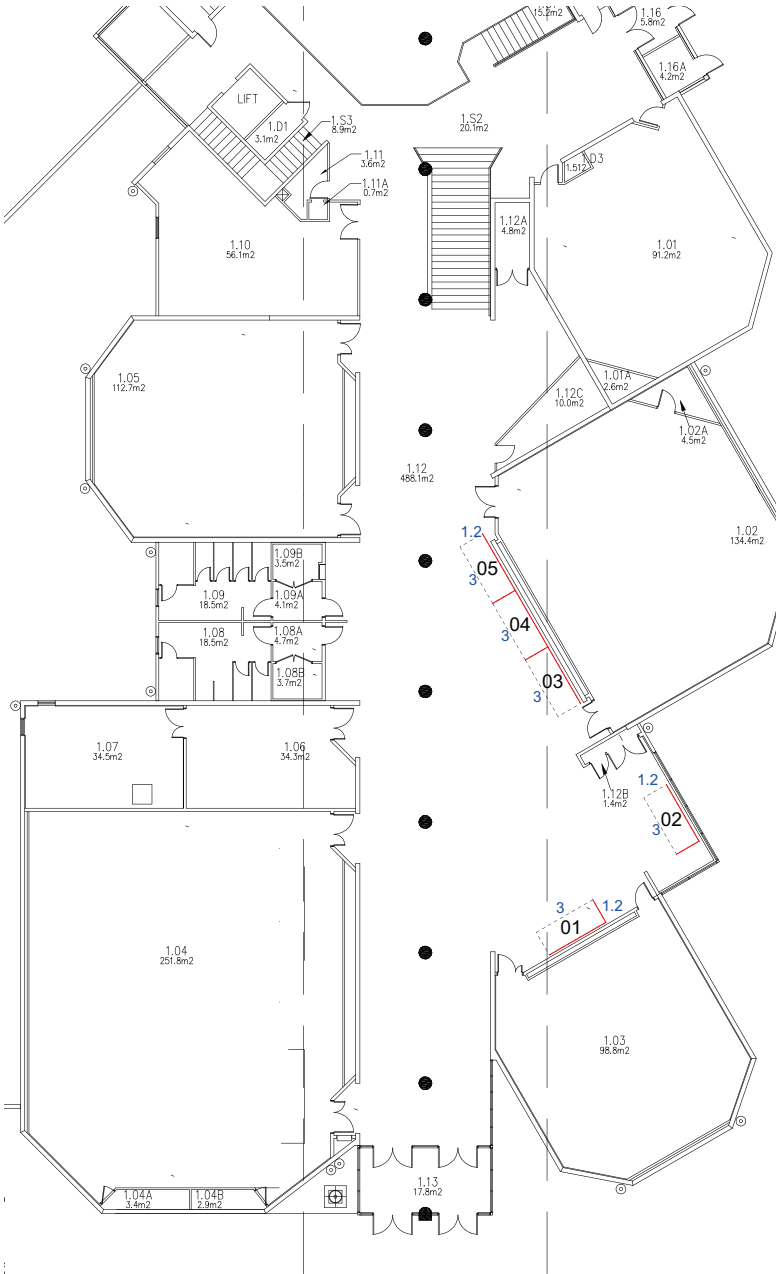
2.25pm – 3.10pm	Venue: S.1.04 Conference Closing Presentation of Best Paper and Best Reviewer Awards Closing Remarks and AAEE 2019 Handover Poroporoaki		
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Thursday 13 December 2018

8.00am for 8.30am start	Associated Deans Teaching and Learning (ADTL) workshop <i>Venue: SB.02, University of Waikato, Hamilton</i>
9.00am	Indigenous People Workshop <i>Venue: G Block, level 1f, Room rkg 1.24, Wintec, Rotokauri Campus, Hamilton</i>

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